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Investigation of the effect of intron-1 beta-globin gene on the expression of human LH-encoding gene in CHO cells

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Abstract

Gonadotropin hormones that LH (Luteinizing hormone) is a member of them belong to the family of glycoprotein hormones. These hormones are hetero-dimer and consist of an alpha (α) chain that is the same as the general subunit in all of them and a specific beta (β) chain. The beta (β) subunit of these hormones also plays a major role in the biological activity of these hormones and is essential. Introns are non-coding gene sequences that are present among the genes coding sequences. Given the effect of introns on increasing gene expression in mammalian cells, the use of these sequences to increase the production of recombinant proteins has attracted the attention of researchers. One of these introns is the beta-globin gene intron, which consists of 2 introns, which its intron I is used more due to its short sequence.
Chinese hamster ovary (CHO) cells are used to produce recombinant proteins more than other hosts due to their high level of expression and better post-translation changes in the protein.
This research will be conducted in three stages after the initial studies:
Stage 1: Cloning the gene structure in the bacterial host and confirming its molecular structure.
Stage 2: Cloning the cut gene under the influence of beta-globin intron inside the CHO expression vector (further confirmation is required for recombination of the transformed cells).
Step 3: Examining the expression of human LH coding gene under the influence of intron-1 using Western Blotting and SDS-PAGE techniques and the effect of intron-1 beta-globin on the production of recombinant LH, performed by ELISA. This research will be conducted to clone and increase the expression of gene encoding human LH hormone under the influence of beta-globin gene intron in Chinese hamster ovary (CHO) cells and finally to increase the production of its recombinant form.